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208 235-5600 Business

November 3, 2020

Arthur Burbank
USDA Forest Service
4350 South Cliffs Dr.
Pocatello, ID 83204

Subject: Biological Selenium Removal Treatment Technology
Water Treatment Pilot Study
September 2020 Progress Report

Dear Art,

This progress report summarizes key activities in September 2020 associated with Phase 2 of the Water Treatment Pilot Study located near Hoopes Spring. This Pilot Study is being conducted as part of the Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS) to provide information on the effectiveness of the active biological treatment system in removing selenium and other COPCs from South Fork Sage Creek Springs and Hoopes Spring.

Work related to the approved Phase 2 Pilot Study continues at the site in accordance with the Final *Phase 2 Pilot Study Work Plan and Sampling and Analysis Plan, Ultra-Filtration/Reverse Osmosis and Biological Selenium Removal Fluidized Bed Bioreactor Treatment Technology* (Phase 2 WP/SAP).

Identification of Deliverables and Data Transmittals

There were no outstanding deliverables or transmittals for the month of September. At the time of this report, we have received laboratory data for Week 133, Week 135, and Week 137. Preliminary laboratory data are presented in Table 1. The field data for the Week 133, Week 135, and 137 sampling events is summarized in Table 2.

Completed Activities

The following activities associated with the Phase 2 Pilot Study were completed in September 2020:

- Continued system operation and treatment of selenium.

The Treatment System Pilot (TSP) influent total selenium concentration for Week 133 was 162 ug/L, 168 ug/L for Week 135, and 172 ug/L for Week 137. The Treatment System Pilot effluent total selenium concentration for Week 133 was 17 ug/L, 13.9 ug/L Week 135 and 11.3 ug/L for Week 137. The average removal efficiency for September was approximately 91.7 % for total selenium removal.

The average flow of the TSP for the month of September was 1,517 gpm. Since full scale operations began in early December 2017 approximately 2.238 billion gallons of impacted water

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has been treated. The mass of selenium removed from December 2017 through September 2020 is approximately 2,437 pounds.

Upcoming Activities

The following activities associated with the Phase 2 Pilot Study are planned through October 2020:

- Continue system monitoring in accordance with the sampling and analysis plan.
- The iron coprecipitation pilot is running well and preliminary indication are showing improved selenium removal.

Please contact me if there are questions regarding this monthly progress report.

Sincerely,

Jeffrey Hamilton
Environmental Engineer

cc:

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Table 1
Laboratory Results Focused Analyte List

Hoopes Springs Water Treatment Plant Pilot Study
Phase 2, Performance Monitoring

		Week 133			Week 135		
Station >>		Influent	Ultra Filtration Backwash	Effluent	Influent	Ultra Filtration Backwash	Effluent
Sample ID >>		SC0920-LSSHS-IN001	SC0920-LSSHS-UFB001	SC0920-LSSHS-EF001	SC0920-LSSHS-IN002	SC0920-LSSHS-UFB002	SC0920-LSSHS-EF002
Date >>		9/2/2020			9/16/2020		
Analyte	**Units**						
General Chemistry							
Ammonia, as N	mg/L	0.026 U	0.026 U	0.073	0.026 U	0.026 U	0.0833
Biochemical Oxygen Demand	mg/L	2 U	2 U	2 U	2 U	2 U	2 U
TSS	mg/L	2 U	2 U	2 U	2 U	2 U	2 U
Nutrients							
Nitrate, as N	mg/L	0.39	0.22	0.88	0.42	0.3	0.36
Sulfide	mg/L	1 U	1 U	1 U	1 U	1 U	1 U
Phosphorus, Total	mg/L	0.0269	0.0233	0.101	0.0282	0.0283	0.0356
Metals and Metalloids							
Selenium, Dissolved	mg/L	0.181	0.0585	0.0192	0.176	0.0606	0.0143
Selenium, Total	mg/L	0.162	0.0529	0.017	0.168	0.0584	0.0139

		Week 137		
Station >>		Influent	Ultra Filtration Backwash	Effluent
Sample ID >>		SC0920-LSSHS-IN003	SC0920-LSSHS-UFB003	SC0920-LSSHS-EF003
Date >>		9/30/2020		
Analyte	**Units**			
General Chemistry				
Ammonia, as N	mg/L	0.026 U	0.026 U	0.026 U
Biochemical Oxygen Demand	mg/L	2 U	2 U	2 U
TSS	mg/L	2 U	2 U	2 U
Nutrients				
Nitrate, as N	mg/L	0.34	0.22	0.37
Sulfide	mg/L	1 U	1 U	1 U
Phosphorus, Total	mg/L	0.0786	0.033	0.0339
Metals and Metalloids				
Selenium, Dissolved	mg/L	0.171	0.0503	0.0117
Selenium, Total	mg/L	0.172	0.0515	0.0113

Notes:
Results presented are preliminary, and have not been validated at he time of this report.
U - Analyte not detected above he method detection limit (MDL).
J - Result is estimated.

Table 2
Field Water Quality Data

Hoopes Springs Water Treatment Plant Pilot Study
Phase 2, Performance Monitoring

		Parameter >>	Dissolved Oxygen	ORP	pH	SC	Temperature	Turbidity
		Units >>	mg/L	mV	SU	umhos/cm	C	NTU
Station	**Sample ID**	**Date**						
Week 133								
Influent	SC0920-LSSHS-IN001	9/2/2020	8.44	291	7.44	452	11.6	0.225
Ultra Filtration Backwash	SC0920-LSSHS-UFB001	9/2/2020	8.08	294	7.62	119	12.24	--
Effluent	SC0920-LSSHS-EF001	9/2/2020	7.78	305	7.35	605	11.94	--
Week 135								
Influent	SC0920-LSSHS-IN002	9/16/2020	7.73	104	7.41	479	13.78	0.6
Ultra Filtration Backwash	SC0920-LSSHS-UFB002	9/16/2020	9.46	104	7.15	205	13.3	1
Effluent	SC0920-LSSHS-EF002	9/16/2020	12.92	114	7.02	508	13.18	1.9
Week 137								
Influent	SC0920-LSSHS-IN003	9/30/2020	15.15	162	7.7	480	15.07	10
Ultra Filtration Backwash	SC0920-LSSHS-UFB003	9/30/2020	11.75	174	7.11	194	13.63	1.1
Effluent	SC0920-LSSHS-EF003	9/30/2020	11.28	192	6.86	468	13.19	0.3

Notes:
-- = Not measured